

US EPA ARCHIVE DOCUMENT

Tox BR ONE-LINER ATTACHED

122804
SHAUGHNESSEY NO.Completed 3/13/84 John Barritt
Revised 4/8/88 J. GBCHEMICAL PROFILE

Pesticide Name: Avermectin (MK-936)

100 Fish & Wildlife Toxicology

<u>Species</u>	<u>Test Material</u>	<u>Result</u>	<u>Category</u>	<u>Reference</u>
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100.1 Minimum Requirements100.1.1 Avian Acute LD50

Bobwhite Quail	91% MK-936	>2000 mg/kg	Core	Beavers, 1983
Mallard duck		85 "	Supp.	Fink & Beavers, 1981

100.1.2 Avian Dietary LC50

Bobwhite Quail	91% MK-936	3102(2338-4393)ppm	Core	Beavers, 1983
Mallard Duck	"	383 (302-487) "	Core	"
Bobwhite	"	1417 "	Invalid	Fink & Beavers, 1981
Mallard	"	899 "	Invalid	"

100.1.3 Fish Acute LC50

Rainbow trout	91% MK-936	3.2(2.2-6.0)ppb	Core	EG&G Bionomics, 1981 (Acc. No. 246358)
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Bluegill Sunfish	91% MK-936	9.6 (5.8-16.0)ppb	Core	"
Bluegill Sunfish	100 mg/kg bait	260 ppm	Supp.	"
Rainbow Trout	100 mg/kg bait	23 ppm	Supp.	"

100.1.4 Aquatic Invertebrate LC50

Daphnia magna	91% tech	0.34 (0.28-0.39) ppb	Core	"
Daphnia magna	100mg/kg bait	7.6 (5.9-9.9) ppm	Supp.	"

100.2 Additional Terrestrial Laboratory Tests

Apis mellifera	.03 lb ai/gal water soluble liquid L-676, 863	"foliar residues"... "Scientifically remain toxic to honey bees 2 days following application"	Sound"	Atkins, 1981. (Acc. no. 252115; EEB file DER's)
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Apis mellifera	L-638,384 L-640, 806 L-676,863	LD ₅₀ = 0.408 ug/bee LD ₅₀ = 0.861 " LD ₅₀ = 0.542 " "Avermectrin is highly toxic to honey bees"	"Scientifically Sound"	Atkins 1980. (Acc. No. 252115; EEB file DER's)
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100.3 Additional Aquatic Laboratory tests

Pink Shrimp <u>Penaeus duorarum</u>	90.5% tech	96-HR. LC50 = 1.6 (0.5-16) ppb	EG&G Bionomics, 1983 Invalid aeration without measurement plus additional raw data needed - obtained 3/26/83
Blue crab <u>Callinectes sapidus</u>	90.5% tech.	96-Hr. LC50 = 153 (119-251) ppb	Invalid aeration without measurement plus additional raw data needed obtained 3/26/83
Eastern oyster <u>Crassostrea virginica</u>	90.5% tech.	48-hr. EC50 = 430 (280-580) ppb	CORE - 13 Invalid additional raw data needed " obtained 3/26/83
Bluegill Sunfish	MK-936	7 day Flow-through NOEL = 2.3 ppb	N/A Acc. No. 252115 Ref. D3d

100.4 Phytoxicity Tests

<u>Lemma gibba</u>	91.4% tech	14-day EC50 = 3.9 (2.3-6.5) ppm	"Scientifically Sound" Hollister, 1981 (Acc. No. 246358)
<u>Selenastrum capricornutum</u> (freshwater algae)	91.4% tech.	9-day EC50 >100 ppm	"Scientifically Sound"

Mysid shrimp LC50 = 0.2 ppb core

Sheepshead minnow LC50 = 15 ppb core

Oyster embryo larvae LC50 = 430 ppb core

Daphnia magna MATC >0.03 <0.09 ppb core
100% mort. at 0.09 ppb

Channel catfish LC50 = 0.024 ppm core

Carp LC50 = 0.042 ppm core

Summary of Toxicity

<u>Species</u>	<u>Test Material</u>	<u>Results</u>	<u>Category</u>
Bobwhite quail	91%	LD ₅₀ > 2000 mg/kg	Core
Bobwhite quail	91%	LC ₅₀ = 3102 ppm	Core
Mallard duck	91%	LC ₅₀ = 383 ppm	Core
Bluegill	91%	LC ₅₀ = 9.6 ppb	Core
Rainbow trout	91%	LC ₅₀ = 3.2 ppb	Core
Daphnia	91%	LC ₅₀ = 0.34 ppb	Core
Daphnia	MK-936 Tech.	LC ₅₀ = 0.22 ppb	Core
Daphnia	Avermectin B _{1a}	LC ₅₀ = 0.42 ppb	Core
Daphnia	Polar metabolite*	LC ₅₀ = 4.2 ppb (binomial) 21.0 ppb moving average)	Core
Daphnia	Moderately polar	6.3 ppb	Core
Daphnia	Nonpolar metabolite	25.4 ppb	Core
Daphnia	Thin film polar metabolite*	76.7 ppb	Core
Daphnia	8 α -Hydroxy Avermectin B _{1a} **	LC ₅₀ = 25.5 ppb	Core
Daphnia	91.43%	MATC > 0.03 < 0.09 ppb	Core
Shrimp, mysid		LC ₅₀ = 0.2 ppb	Core
head Fathead minnow		LC ₅₀ = 15 ppb	Core
Oyster embryolarvae	48-hr	LC ₅₀ = 430 ppb	Core

Avermectin is highly toxic to very highly toxic to mammals (mouse LD₅₀ = 13 to 23 mg/kg; rat LD₅₀ = 10 to 11 mg/kg; weanling rat LD₅₀ = 1.5 mg/kg). It has an effect on reproduction in rats at 0.1 to 0.5 mg/kg day.

The nonpolar metabolite has an LD₅₀ of > 48 mg/kg in mice. The polar* metabolite has an LD₅₀ of > 5000 mg/kg in mice.

*The polar metabolite is the last one formed and is what the parent becomes after about 27 hours.

**Major soil metabolite of Avermectin B_{1a}. This metabolite accounts for up to 20 percent of the total soil residue during the half-life of parent avermectin B_{1a} of 28 to 56 days. Also, the half-life of the metabolite is similar to that of the parent.

Abamectin (MK-936) may persist in the field with a half-life of a month. This was based on a field dissipation study reviewed by EAB (September 5, 1985 review). However, based on another EAB review (August 28, 1985), it is reported that abamectin has a photolytic half-life of 3.5 to 12 hours.

101 General Toxicology

See attached one-liner from Tox Br.

References from Toxicology Branch/HED are not available at this time.

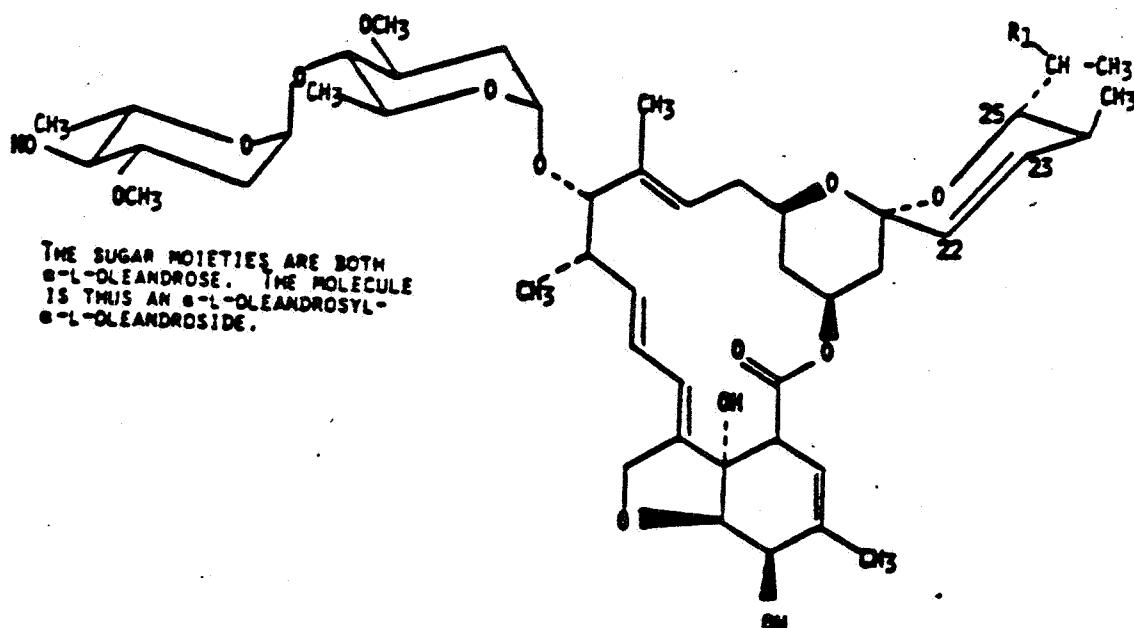
102 Physical and Chemical Properties102.1 Chemical Name (MK-936 is a mixture of two sugar moieties):

Avermectin Bla = (5-O-demethylavermectin A_{1a})

Avermectin B_{1b} = (5-O-demethyl)-25-de-(1 methylpropyl) -25-(1-methylethyl) avermectin A_{1a}.

102.2 Structural Formula

MK-936
AVERMECTIN B₁
L-676.863



R₁ = C₂H₅ > B01 (AVERMECTIN B_{1a}. L-676.863)
R₁ = CH₃ < B02 (AVERMECTIN B_{1b})

102.3 Common Name

MK-936; L676-863; or Avermectin B₁ = (97.5% B_{1a} + 2.5% B_{1b})
for Bla R = CH₂CH₃
for Blb R = CH₃

102.4 Trade Name

Avid 0.15 EC miticide/Insecticide
contains miimum 80% Bla

102.5 Molecular Weight

873.10 (Avermectin Bla)
859.07 (Avermectin Blb)

102.6 Physical State

Technical MK-936

An odorless, off-white to slightly yellow, crystalline solid.

Avid EC

a pale yellow to yellow liquid EC with hexanal odor

102.7 Properties

102.7.1 Solubility

Water < 0.01 mg/ml (10 ppm)
ethanol > 3 mg/l

103 Behavior in the Environment

103.1 Soils

The following is a verbatim report of the registrant's mobility and fate in soils data (Acc. No. 252115; references D3b and D3c). EEB has not received EAB's review of this data as of 3-20-84. Therefore these data should not yet be considered valid nor acceptable.

The following EAB reviews are on file:

<u>Date</u>	<u>Conclusions</u>
2/5/82	1/2 life in sandy loam = 4 weeks 1/2 life in construction sand (coarse) = 10 weeks
4/18/83	Unreviewed report claimed that in soil, photolytic half-life = 20 hours
3/28/84	t _{1/2} : Avermectin, aerobic conditions, 2 weeks - 2 months depending on soil type. Anaerobic degradation slower or non-existent. Bioaccumulation: bluegill, 69 x whole fish, 30 for fillet 110 viscera, stopped accumulation after 10 days. Depuration 2 weeks Photodegradation: Rapid photolysis, $\frac{1}{2}$ life \leq 12 hrs in water < 1 day in soil Mobility in soil. Low tendency to leach

Avermectin science review

Page _____ is not included in this copy.

Pages 7 through 19 are not included in this copy.

The material not included contains the following type of information:

- Identity of product inert ingredients
 - Identity of product impurities
 - Description of the product manufacturing process
 - Description of product quality control procedures
 - Identity of the source of product ingredients
 - Sales or other commercial/financial information
 - A draft product label
 - The product confidential statement of formula
 - Information about a pending registration action
 - FIFRA registration data
 - The document is a duplicate of page(s) _____
 - The document is not responsive to the request
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The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

103.2 Water

From EAB review by C. Fletcher, 18 April 1983:

"Avermectin Bla is stable to hydrolysis over pH range of 5 to 9 at temperature of 25°C. This conclusion can be extrapolated to Avermectin Blb".

4/18/83 EAB review Unvalidated report claims photolytic half-life of
103.3 Plant Avermectin Bla in water = 18 hours

103.4 Animal

From summary of reference D3e Acc. No. 252115 "Uptake, Depuration and Bioconcentration of ^3H -Avermectin Bla by Bluegill Sunfish (Lepomis macrochirus)". The following is a verbatim summary. EEB has not yet (3-20-84) received EAB's review of this data, therefore it should not be considered valid nor acceptable:

20

SUMMARY

A dynamic 42-day study was conducted to evaluate the bioconcentration of ^3H -Avermectin B_{1a} by bluegill sunfish (*Lepomis macrochirus*). A flow-through proportional diluter system was used to maintain a mean water concentration of 0.099 $\mu\text{g/l}$ ^3H -Avermectin B_{1a} for a 28-day exposure period. Radioanalysis of whole fish, fillet and visceral portions throughout the exposure period indicated a gradual uptake of ^3H -Avermectin B_{1a}. Daily bioconcentration factors ranged from 19-69, 6.6-33 and 24-110 for whole fish, fillet and viscera, respectively. Uptake tissue concentrations of ^3H -Avermectin B_{1a} ranged from 1.9-6.8 ppb for whole fish, 0.66-3.3 ppb for fillet and 2.4-11 ppb for viscera. The fish ceased accumulating ^3H -Avermectin B_{1a} at about day 10. The compound appeared to have reached a steady-state plateau as indicated by a linear regression analysis of days 10, 14, 21 and 28 whole fish residue data.

To measure the elimination of ^3H -Avermectin B_{1a}, the test fish were placed in clean water for 14 days. Radioanalysis throughout the depuration period indicated 95, 91 and 95 percent clearance rates from whole fish, fillet and viscera, respectively. The whole fish concentration of ^3H -Avermectin B_{1a} dropped from a day 28 uptake value of 6.8 ppb to 0.32 ppb by day 14 of the depuration period. Fillet levels decreased from 3.0 ppb on day 28 to 0.27 ppb by the end of the study; whereas, viscera concentrations dropped from 11 ppb on day 28 to 0.53 ppb by day 14 depuration.

A two-compartment kinetic model was used for analysis of the uptake-depurration whole fish data. The graphical method employed linear regression analysis and yielded an uptake rate constant (K_1) of 11 ppb in fish/ppb in water/day, a depuration rate constant (K_2) of 0.21 day⁻¹, and a calculated steady-state bioconcentration factor (BCF) of 52. This latter value was 75% of the actual day 28 whole fish bioconcentration factor of 69.

103.5 Residues

The following is taken verbatim from the registrant's submission Acc. No. 252115 reference D₂ "Residue Data on Non-food Crops and Foliage". It has not yet been reviewed by EAR/HED for validity nor acceptability (as of 3-20-84).

22

Section D2

Residue Data in Non-Food Crops and Foliage

Avermectin B₁ (MK-936) has been found to be subject to rapid degradation under both laboratory and field conditions. Figure 1 summarizes the results of a thin film study with C¹⁴ avermectin B_{1a} subject to both light (sun lamp) and darkness. The figure shows that approximately 50% of the total radioactivity (RAD) is lost after 6 days under lighted conditions, while little loss was found in similar samples during the same period in darkness. In contrast there was a complete loss of avermectin B_{1a} under both conditions, however, it occurred much more rapidly under light.

Applied under field conditions on citrus trees, avermectin B₁ (MK-936) fruit peel residues (as avermectin B_{1a}) also decline rapidly to negligible levels. Figure 2 shows the degradation of avermectin B_{1a} residues on orange peel following the application of MK-936 to orange trees at 6ppm avermectin sprayed to run off with and without the addition of 0.20% crop oil. These data are representative of residues that have been assayed on oranges from individual treated trees in Florida. The figure shows that 4 hours after application, avermectin B_{1a} residues were 9.3 and 21.8 ng/g of peel with and without the addition of oil, respectively. Avermectin B_{1a} degrades in the absence of oil to 1 ppb 14 days post application. At that same time, 3.5 ppb of avermectin B_{1a} remained on the citrus peel when the application was made with the addition of spray oil.

Only trace residues of avermectin B_{1a} remain 1 day after application at the maximum use rates, and, therefore, do not represent any hazard to humans upon reentry. A more complete description of avermectin B_{1a} degradation quantitatively and qualitatively on citrus products will be included in a Petition for a Temporary Tolerance to be submitted to EPA in 1984.

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23

FIGURE 1

% OF RADIODACTIVITY OR avermectin B1A REMAINING AFTER
EXPOSURE OF ^{14}C avermectin B1A AS A THIN FILM
TO LIGHT OR DARKNESS

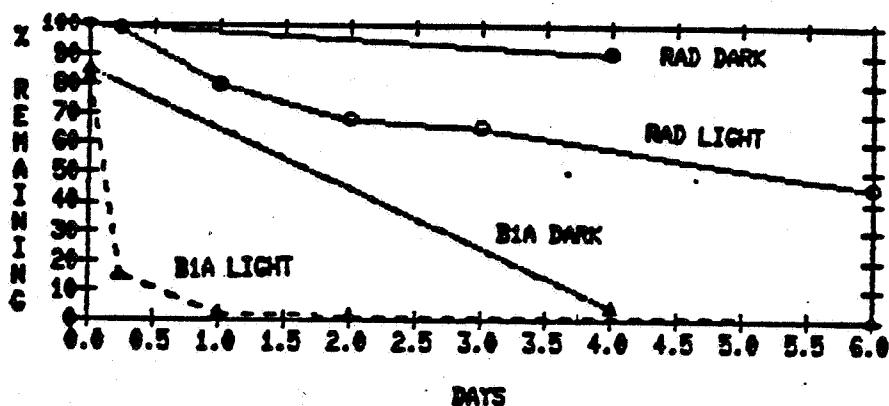
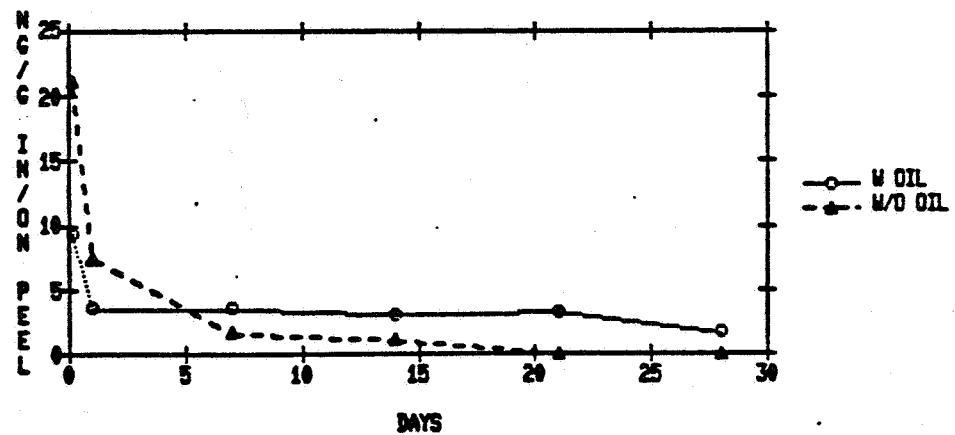


FIGURE 2

MK-9936 RESIDUES IN/ON HAMLINE ORANGE PEEL (FLORIDA)



24

935

Assessment	Teratology	Material No.	Accession No.	Results:	TOX Category	CUL Grade	Supplementary Doc. No.	
							Supp. doc. no.	Supp. doc. no.
Teratology - rat; Merch Institute for Therapeutic Research Studies; TT #82-705-1; 11/10/82	Tech MK-0936 94% Lot #L-676, 863-00V50	24915c		<u>Range Finding</u> Levels tested by gavage in Sprague-Dawley strain - 0, 0.25, 0.5, 1.0, and 2.0 mg/kg/day Maternal NOEL = 1.0 mg/kg Maternal LEL = 2.0 mg/kg/day			Supplementary 004114	Supplementary 004114
Teratology - rat; Merch Institute for Therapeutic Research Studies; TT #82-705-0; 11/10/82	Tech MK-0936 94% Lot #L-676, 863-00V50	249152		Teratogenic NOEL > 1.6 mg/kg/day (HDT) Maternal NOEL > 1.6 mg/kg Feto toxic NOEL > 1.6 mg/kg/day Levels tested by gavage in Sprague-Dawley strain - 0, 0.4, 0.8, and 1.6 mg/kg/day			Supplementary 004114	Supplementary 004114
Teratology - rat; MS&D; TT#77-701-0	Avermectin B1a	247291		<u>PILOT STUDY</u> Teratogenic NOEL = 1.6 mg/kg/day Teratogenic LEL = 3.2 mg/kg/day (increase in the number of visceral and skeletal malformations at 3.2 mg/kg/day) Levels tested = 0.8, 1.6, 3.2 mg/kg/day by gavage in CRCD strain			Supplementary 001815	Supplementary 004335
Teratology - rabbit; Merch; TT #82-700-1	Tech MK-0936 94% pure Lot #L-767 863-00V50	249152		<u>Range Finding</u> Maternal NOEL = 2.0 mg/kg/day Maternal LEL = 3.0 mg/kg/day			Supplementary 004114	Supplementary 004114

INERT INGREDIENT INFORMATION IS NOT INCLUDED

Study/Lab/Study #/Date	Material	Accession No.	Results: LD50, LC50, FIS, NOEL, LEL	TOX Category	CORE Grade/ Doc. No.
Teratology - rabbit; Merch; TT #82-706-01	Tech MK-0936 94% pure Lot #L-767 863-00V50	249152	Teratogenic NOEL > 2.0 mg/kg (HDT) Feto toxic NOEL > 2.0 mg/kg/day Maternal NOEL = 1.0 mg/kg Maternal LEL = 2.0 mg/kg (decrease in body weight, food con- sumption and water). Levels tested by gavage in New Zealand White strain - 0, 0.5, 1.0, & 2.0 mg/kg/day	Supple- mentary 004114 Minimum 004335	
Teratology - rabbit; MS&D; TT#76-24-A; and TT#77-702-01-1	Avermectin B1a	247291	PILOT STUDY Teratogenic NOEL = 0.5 mg/kg/day Teratogenic LEL = 1.0 mg/kg/day (in- crease in the number of visceral malformations and skeletal variations) Levels tested = .25, .5, 1.0, 2.0, 4.0 mg/kg by gavage.	Supple- mentary 001815	
Teratology - mice; MS&D; TT#77-705-0	C-076 (B1a) Lot P 20	246894	Teratogenic NOEL < 0.4 mg/kg/day (ablepharia and cleft palate) Maternal NOEL < 0.1 mg/kg/day (mor- tality) Levels tested by gavage in CF strain - 0, 0.1, 0.2, 0.4 and 0.8 mg/kg/day Note fetuses at 0.1 and 0.2 mg/kg/ day were not examined.	Supple- mentary 001535	

Study/Lab/Study #/Date	Material	EPA Accession No.	Results: LD50, LC50, PIS, NOEL, LEL	TOX Category	CURE Grade/ Doc. No.
Teratology - mice; MS&D; TT#76-723-0	C-076 (B1a)	246894	Teratogenic NOEL < 0.4 mg/kg/day (cleft palate) Note - fetuses at 0.1 and 0.2 mg/kg were not examined. Maternal NOEL < 0.1 mg/kg (mortality) Levels tested by gavage = 0.1, 0.2, 0.4, 0.8 mg/kg/day	Supple- mentary 001535	
Teratology - mice; Merck Sharp and Dohme Res Lab; TT#76-723-3	C-076 (B2)	246894	Teratogenic NOEL < 0.2 mg/kg/day (cleft palate) Note - fetuses at 0.1 mg/kg were not examined. Maternal NOEL < 0.1 mg/kg/day (LDT) (mortality) Levels tested by gavage = 0, 0.1, 0.2, 0.4, 0.8 mg/kg/day.	Supple- mentary 001535	
One generation reproduction - rat; MS&D; TT#77-706-0	C-076 (B1a)	246894	NOEL = < 0.5 mg/kg/day (LDT) (decreased pup survival and growth rate between 1 to 21 days; delay in opening of eyes) Levels tested by gavage in Charles River CD strain = 0, 0.5, 1.0 and 3.0 mg/kg/day Note only females were dosed	Supple- mentary 001535	
One generation reproduction - rat; MS&D; TT#77-712-0	C-076 (B1a)	246894	NOEL = 0.1 mg/kg/day LEL = 0.2 mg/kg/day (one pup had spastic movements decreased pup weight; delayed incisor eruption) Levels tested by gavage 0, 0.1, 0.2 and 0.4 mg/kg/day This study is considered a teratology study with only postnatal evaluation and not a true reproduction study since males were not tested.	Supple- mentary 001535	

Study/Lab/Study #/Date	Material	EPA Accession No.	Results: LD50, LC50, PIS, NOEL, LEL	TOX Category	CORE Grade/ Doc. No.
					Supple- mentary 003967
9-Day dermal exploratory - rabbit; MS&D; TT# 83-2967	MK-0936 EC formulation Avid		Toxicity greater in rabbits unoccluded at 1000 mg/kg than in rabbits occluded at 1000 mg/kg.		Minimum 001535
10 Day oral - pregnant mice; MS&D; TT#77-717-1	C-076 (B1a) Lot P 34	246894	Maternal NOEL = 0.05 mg/kg/day Maternal LEL = 0.075 mg/kg/day(mortality), Levels tested by gavage in CF, strain - 0.025, 0.050, 0.075 and 0.10 mg/kg/day		Minimum 001535
23-Day dermal - rabbit; MS&D; TT#83-066-0; 5/4/84	MK-0936 EC formulation Avid		NOEL < 250 mg/kg (LDT) (testicular degeneration) Levels tested: 0, 250, 500 and 1000 mg/kg		Minimum 003967
24-Day dermal - rabbit; MS&D; TT#83-2947	MK-0936 EC formulation Avid		NOEL < 125 mg/kg (LDT) (testicular degeneration) Levels tested: 0, 125, 250, 500 and 1000 mg/kg.		Minimum 003967
18 Week oral - dog; MS&D; TT#76-073-0	C-076 (B1a)	246895	NOEL = 0.25 mg/kg/day LEL = 0.5 mg/kg/day (body tremors, one death, pathology of liver, decreased body weight) Levels tested by gavage in beagles- 0, 0.24, 0.5, 2.0 and 8.0 mg/kg/day		Minimum 004114
14 Week oral - rat; MS&D; TT#77-043-0	C-076 (B1a) Lot P 22	246895	NOEL > 0.4 mg/kg/day (HDT) Levels tested by gavage = 0, 0.1, 0.2, 0.4 mg/kg/day. Rats used in this study had previously been exposed in <u>utero</u> to the test material at <u>the</u> respective concentrations. Levels tested = 0, 0.01, 0.2 and 0.4 mg/kg/day		Supple- mentary 001535 Minimum 004114

Study/Lab/Study #/Date	Material	EPA Accession No.	Results: LD ₅₀ , LC ₅₀ , PIS, NOEL, LEL	TOX Category	CORE Grade/ Doc. No.
21 - Day dermal - rabbit	Tech		requirement is waived		003252
Metabolism - rat; MS&D; No. ARM-1; 9/83	Tritium and C14 labeled Avermectin B ₁		68.7-81.6% of label is excreted in the feces by day 7. T _{1/2} is 1.2 days.		Supplementar 003967
Mutagenic - Ames; MS&D; No. TT #82-8013; 8/30/83	Tech. Avermectin B ₁		Not mutagenic in presence of S-9 activation. Mutagenicity without S-9 activation could not be evaluated due to absence of positive control.		Acceptable with S-9 activation Unacceptable with S-9 activation 003967
Mutagenic - in-vivo bone marrow cytogenetics - mice; MS&D; No. TT#83-900-6; 6/83	Tech. Avermectin B ₁		No chromosome aberrations in male mice at doses of 1.2 and 12.0 mg/kg. Female mice not tested.		Acceptable for male mice only 003967
Mutagenic - rat hepatocyte; MS&D; Nos.: TT#82-8520; TT#82-8523; TT#82-8525; TT#82-8526; TT#8302; 4/21/83	Tech. Avermectin		*Under conditions of the study Avermectin (0.3 and 0.6 mM) caused an induction of single strand DNA breaks in rat hepatocytes <i>in vitro</i> ; there was no effect at lower doses. No effect was observed when the assay was carried out on hepatocytes from rats dosed <i>in vivo</i> at the LD ₅₀ dose level (10.6 mg/kg).		Acceptable 003967
Mutagenic - mammalian cell; MS&D; Nos.: TT#82-8506; TT#82-8510; TT#82-8519; 3/8/83	Tech. Avermectin		*MK-0936, Avermectin, was not mutagenic for V-79 cells under the conditions of the assay, but in the presence of S-9 appeared to have a mutagenic potential, provided the test cells had an appropriate level of sensitivity.		Acceptable 003967

Study/Lab/Study #/Date	Material	EPA Accession No.	Results: LD50, LC50, PIS, NOEL, LEL	TOX Category	CORE Grade/Doc. No.
Acute dermal LD50 - rabbit; Merck Sharp and Dohme; TT#81-3021; 3/16/83	Tech. Avermectin		LD50 > 1600 mg/kg Levels tested: 100, 200, 400, 800 and 1600 mg/kg.		Supple- mentary 003967
Dermal sensitization - guinea pig; MS&D; TT#83-2506; 4/15/83	Tech. Avermectin		Negative for skin sensitization.		Minimum 003967
Acute dermal LD50 - rabbit; MS&D; TT#83-031-0	MK-0936 EC formulation Avid		One death LD50 > 2000 mg/kg (only level tested)	III	Minimum 003967
Acute oral LD50 - rat; MS&D; TT#82-097-0	MK-0936 EC formulation Avid		LD50 = 0.7222 ml/kg Levels tested: 0, 25, 0.40, 0.64, 1.02 and 1.63 ml/kg.	II	Minimum 003967
Primary dermal irritation - rabbit; MS&D; TT#82-3036; 12/2/82	MK-0936 EC formulation Avid		Slight erythema and edema.	III	Minimum 003967
Primary eye irritation - rabbit; MS&D; TT#82-3035; 12/6/82	MK-0936 EC formulation Avid		Conjunctivitis and iritis which cleared after 8 days.	III	Minimum 003967
Acute inhalation LC50 - rat; Hazleton; #284-126; 5/22/79	MK-0936 EC formulation Avid		No deaths LC50 > 5.73 ml/kg nominal concentration only.	IV	Supple- mentary 003967
Acute oral LD50 - rat; MS&D; TT#81-2879; 8/7/81	0.022% Avermectin B1		No deaths. LD50 > 5.0 gm/kg	III	Minimum 003984
Acute dermal LD50 - rabbit; MS&D; TT#81-2877; 8/31/81	0.022% Avermectin B1		No deaths. LD50 > 2.0 gm/kg	III	Minimum 003984

INSERT INGREDIENT INFORMATION IS NOT INCLUDED

Page 6 of 9

Study/Lab/Study #/Date	Material	EPA Accession No.	Results: LD ₅₀ , LC ₅₀ , P _i S, NOEL, LEL	TOX Category	CORE Grade/Doc. No.
Primary dermal irritation - rabbit; MS & D; TT#83-2864; 2/1/84	0.022% Avermectin B ₁		Slight conjunctivitis in both washed and unwashed eyes which were normal at 24 hr. [REDACTED]	III	Minimum 003984 [REDACTED]
Primary dermal irritation - rabbit; MS&D; TT#83-2864; 2/1/84	0.022% Avermectin B ₁	246894	No irritation. [REDACTED]	IV	Minimum 003984
Mutagenic - Ames; MS&D; TT#76-8052	C-076 (B _{1a})		Negative for mutagenicity		Acceptable 001535
Acute oral LD ₅₀ - mice; MS&D	C-076 (B _{1a})	246894	LD ₅₀ = 13.6 - 23.8 mg/kg	I	Supple- mentary 001535
Acute oral LD ₅₀ - rat; MSD	C-076 (B _{1a})	246894	LD ₅₀ = 10.6 (7.7 - 14.5) (M) mg/kg LD ₅₀ = 11.3 (7.5 - 17.1) (F) mg/kg LD ₅₀ = 1.5 (1.1 - 2.2) mg/kg (wean- ling)	I	Supple- mentary 001535
Acute oral - mice; MS&D; TT#76-723-1 and TT#76-723-2	C-076 (B _{1a}) C-076 (B ₂)	246894	Range finding Death in mice given 0.1, 0.25, 1.0 and 8.0 mg/kg/day of C-076 (B _{1a}). No body weight decrease at 0.1, 0.25, 0.5 mg/kg/day.		Supple- mentary 001535
Acute inhalation LC ₅₀ - rat; Biodynamics; TT#83-7651; 2/24/84	MK-0936 E.C. formulation AVIDTM 2.2% ai	252914	LC ₅₀ = 1.033 (0.634-1.683) mg/L (M) LC ₅₀ = 1.141 (0.594-2.193) mg/L (F) LC ₅₀ = 1.062 (.742-1.521) mg/L (M&F) Gravimetric Levels tested: 0.033 - 6.5 mg/L	II	Minimum 001886
Dissimilation chemicals metabolite or impurity or contaminant or salt or photodegradent or etc			#517T (L-652, 871-00N01 polar metabolite) #517U (L-652-280-00N02 non-polar metabolite)		

Tox Chem No. 63AB

File Last Updated

Current Date 02/25/85

Study/Lab/Study #/Date	Material	EPA Accession No.	Results: LD50, LC50, PIS, NOEL, LEL	TOX Category	CORE Grade/ Doc. No.
21-Day dermal - rabbit; MSD; TT-84-045-0; August 28, 1984	MK - 0936 EC based formulation	254601	NOEL for testicular effects = 125 mg/kg/day. LEL = 250 mg/kg/day (decreased testicular weight and histological seminiferous tubule degeneration.) Levels tested: 0, 31, 625, 125, 250, 1000 mg/kg in New Zealand White strain.		Minimum 004331

Tox Chem No. 63AB

File Last Updated _____

Current Date 02/28/85

Study/Lab/Study #/Date	Material	EPA Accession No.	Results: LD ₅₀ , LC ₅₀ , PIS, NOEL, LEL	TOX Category	CORE Grade/ Doc. No.
Antidote - exploratory nonspecific - dog; MSD; TRT#84-085-0; December 10, 1984	MK-0936 Technical	255978	Ipecac given at 15 minutes after dose of MK-0936 induces vomiting and results in no comas or death in 21 dogs.		Acceptable 004395
Acute dermal LD ₅₀ - rabbit; MSD; TRT#83-064-0; February 8, 1984	MK-0936 Technical	255978	LD ₅₀ > 2000 mg/kg; no deaths.	Minimum	004394
Antidote	Technical		Data requirement is waived for determining a specific antidote.		004395